



## SEQUENCE LISTING

&lt;110&gt; Corrado FOGHER

<120> SYNTHETIC POLYNUCLEOTIDE CODING FOR HUMAN LACTOFERRIN, VECTORS,  
CELLS AND TRANSGENIC PLANTS CONTAINING IT

&lt;130&gt; 4161-14 / X89727RVP

&lt;140&gt; 09/743,823

&lt;141&gt; 2001-08-22

&lt;150&gt; PCT/IT99/00226

&lt;151&gt; 1999-07-19

&lt;150&gt; IT RM98A000478

&lt;151&gt; 1998-07-17

&lt;160&gt; 26

&lt;170&gt; MS Word

&lt;210&gt; 1

&lt;211&gt; 2079

&lt;212&gt; DNA

&lt;213&gt; Artificial Sequence

&lt;220&gt;

&lt;223&gt; Description of Artificial Sequence: Synthetic human lactoferrin

&lt;220&gt;

&lt;221&gt; CDS

&lt;222&gt; (1)..(2076)

&lt;400&gt; 1

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Gly	Arg	Arg	Arg	Arg	Ser	Val	Gln	Trp	Cys	Ala	Val	Ser	Gln	Pro	Glu	
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gcc	aca	aaa	tgc	ttc	caa	tgg	caa	agg	aat	atg	aga	aaa	gtt	cgt	gga	96
Ala	Thr	Lys	Cys	Phe	Gln	Trp	Gln	Arg	Asn	Met	Arg	Lys	Val	Arg	Gly	
		20					25						30			

cct	cct	gta	tct	tgc	ata	aag	aga	gat	tca	ccc	atc	cag	tgt	atc	cag	144
Pro	Pro	Val	Ser	Cys	Ile	Lys	Arg	Asp	Ser	Pro	Ile	Gln	Cys	Ile	Gln	
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gca	att	gcg	gaa	aac	aga	gct	gat	gct	gtg	act	ctt	gat	ggg	ggg	ttc	192
Ala	Ile	Ala	Glu	Asn	Arg	Ala	Asp	Ala	Val	Thr	Leu	Asp	Gly	Gly	Phe	
	50					55				60						

ata	tac	gag	gca	gga	ctt	gcc	cca	tac	aaa	ctg	cga	cct	gta	gcg	gcg	240
Ile	Tyr	Glu	Ala	Gly	Leu	Ala	Pro	Tyr	Lys	Leu	Arg	Pro	Val	Ala	Ala	
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gaa	gtc	tac	ggg	acc	gaa	aga	caa	cca	cga	act	cac	tat	tat	gct	gtg	288
Glu	Val	Tyr	Gly	Thr	Glu	Arg	Gln	Pro	Arg	Thr	His	Tyr	Tyr	Ala	Val	

85					90					95						
gct	ggt	gtg	aag	aag	ggc	gga	tct	ttt	cag	ctg	aac	gaa	ctt	caa	ggt	336
Ala	Val	Val	Lys	Lys	Gly	Gly	Ser	Phe	Gln	Leu	Asn	Glu	Leu	Gln	Gly	
			100					105					110			
ctg	aag	tca	tgc	cac	aca	gga	ctt	cgc	agg	acc	gct	gga	tgg	aat	gtc	384
Leu	Lys	Ser	Cys	His	Thr	Gly	Leu	Arg	Arg	Thr	Ala	Gly	Trp	Asn	Val	
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Pro	Ile	Gly	Thr	Leu	Arg	Pro	Phe	Leu	Asn	Trp	Thr	Gly	Pro	Pro	Glu	
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Pro	Ile	Glu	Ala	Ala	Val	Ala	Arg	Phe	Phe	Ser	Ala	Ser	Cys	Val	Pro	
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Gly	Ala	Asp	Lys	Gly	Gln	Phe	Pro	Asn	Leu	Cys	Arg	Leu	Cys	Ala	Gly	
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aca	ggg	gaa	aac	aaa	tgt	gca	ttc	tca	tcc	cag	gaa	ccg	tac	ttc	agc	576
Thr	Gly	Glu	Asn	Lys	Cys	Ala	Phe	Ser	Ser	Gln	Glu	Pro	Tyr	Phe	Ser	
			180					185					190			
tac	tct	ggt	gcc	ttt	aag	tgt	ctt	aga	gac	ggt	gct	gga	gat	gtt	gct	624
Tyr	Ser	Gly	Ala	Phe	Lys	Cys	Leu	Arg	Asp	Gly	Ala	Gly	Asp	Val	Ala	
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ttt	att	aga	gag	agc	aca	gtg	ttt	gag	gat	ctt	tca	gac	gag	gct	gaa	672
Phe	Ile	Arg	Glu	Ser	Thr	Val	Phe	Glu	Asp	Leu	Ser	Asp	Glu	Ala	Glu	
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Arg	Asp	Glu	Tyr	Glu	Leu	Leu	Cys	Pro	Asp	Asn	Thr	Arg	Lys	Pro	Val	
225					230					235					240	
gac	aag	ttc	aaa	gat	tgc	cat	ctt	gca	cgg	gtc	cct	tct	cat	gcc	gtt	768
Asp	Lys	Phe	Lys	Asp	Cys	His	Leu	Ala	Arg	Val	Pro	Ser	His	Ala	Val	
			245					250						255		
gtg	gca	cga	agt	gtt	aat	gga	aag	gag	gat	gcc	atc	tgg	aat	ctt	ctc	816
Val	Ala	Arg	Ser	Val	Asn	Gly	Lys	Glu	Asp	Ala	Ile	Trp	Asn	Leu	Leu	
			260				265						270			
cgc	caa	gca	cag	gaa	aag	ttt	gga	aag	gac	aag	tca	ccg	aaa	ttc	cag	864
Arg	Gln	Ala	Gln	Glu	Lys	Phe	Gly	Lys	Asp	Lys	Ser	Pro	Lys	Phe	Gln	
		275					280					285				
ctc	ttt	ggt	tcc	cct	agt	ggg	cag	aaa	gat	ctt	ctg	ttc	aag	gac	tct	912
Leu	Phe	Gly	Ser	Pro	Ser	Gly	Gln	Lys	Asp	Leu	Leu	Phe	Lys	Asp	Ser	
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gcc	att	ggg	ttt	tcg	aga	gtg	cca	cct	agg	ata	gat	tct	ggg	ttg	tac	960
Ala	Ile	Gly	Phe	Ser	Arg	Val	Pro	Pro	Arg	Ile	Asp	Ser	Gly	Leu	Tyr	
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ctt ggc tcc gga tac ttt act gca att cag aac ttg agg aaa agt gag	1008
Leu Gly Ser Gly Tyr Phe Thr Ala Ile Gln Asn Leu Arg Lys Ser Glu	
325 330 335	
gag gaa gtt gct gcc cgg cgt gcg cgg gtc gtt tgg tgt gcg gtg gga	1056
Glu Glu Val Ala Ala Arg Arg Ala Arg Val Val Trp Cys Ala Val Gly	
340 345 350	
gag caa gag ttg cgc aag tgt aac cag tgg agt ggt ttg agc gaa gga	1104
Glu Gln Glu Leu Arg Lys Cys Asn Gln Trp Ser Gly Leu Ser Glu Gly	
355 360 365	
tct gtg acc tgc tca tcg gcc tcc act aca gaa gat tgc atc gcc ctg	1152
Ser Val Thr Cys Ser Ser Ala Ser Thr Thr Glu Asp Cys Ile Ala Leu	
370 375 380	
gtg ttg aaa gga gaa gct gat gcc atg agt ttg gat gga gga tat gtt	1200
Val Leu Lys Gly Glu Ala Asp Ala Met Ser Leu Asp Gly Gly Tyr Val	
385 390 395 400	
tac act gca ggt aaa tgt ggt ttg gtg cct gtc ctt gca gag aac tac	1248
Tyr Thr Ala Gly Lys Cys Gly Leu Val Pro Val Leu Ala Glu Asn Tyr	
405 410 415	
aaa tca caa caa agc agt gac cct gat cct aac tgt gtg gat aga cct	1296
Lys Ser Gln Gln Ser Ser Asp Pro Asp Pro Asn Cys Val Asp Arg Pro	
420 425 430	
gtg gaa gga tat ctt gct gtg gcg gtg gtt agg aga tca gac act agc	1344
Val Glu Gly Tyr Leu Ala Val Ala Val Val Arg Arg Ser Asp Thr Ser	
435 440 445	
ctt acc tgg aac tct gtg aaa ggc aag aag tcc tgc cac acc gcc gtg	1392
Leu Thr Trp Asn Ser Val Lys Gly Lys Lys Ser Cys His Thr Ala Val	
450 455 460	
gac agg act gca ggt tgg aat atc ccc atg gga ttg ctc ttc aac cag	1440
Asp Arg Thr Ala Gly Trp Asn Ile Pro Met Gly Leu Leu Phe Asn Gln	
465 470 475 480	
acg ggc tcc tgc aaa ttt gat gaa tat ttc agt caa agc tgt gcc cct	1488
Thr Gly Ser Cys Lys Phe Asp Glu Tyr Phe Ser Gln Ser Cys Ala Pro	
485 490 495	
ggt tct gac cca aga tct aat ctc tgt gct ttg tgt att gga gat gag	1536
Gly Ser Asp Pro Arg Ser Asn Leu Cys Ala Leu Cys Ile Gly Asp Glu	
500 505 510	
caa ggt gag aat aag tgc gtt ccc aac agc aac gag aga tac tac ggt	1584
Gln Gly Glu Asn Lys Cys Val Pro Asn Ser Asn Glu Arg Tyr Tyr Gly	
515 520 525	
tac act ggg gct ttc cgt tgc ttg gct gag aat gct gga gac gtt gca	1632
Tyr Thr Gly Ala Phe Arg Cys Leu Ala Glu Asn Ala Gly Asp Val Ala	
530 535 540	

ttt gtg aaa gat gtc act gtc ttg cag aac act gat gga aat aac aat	1680
Phe Val Lys Asp Val Thr Val Leu Gln Asn Thr Asp Gly Asn Asn Asn	
545 550 555 560	
gag gca tgg gct aag gat ttg aag ctt gca gac ttt gcg ttg ctg tgc	1728
Glu Ala Trp Ala Lys Asp Leu Lys Leu Ala Asp Phe Ala Leu Leu Cys	
565 570 575	
ctc gat ggc aaa cgt aag cct gtg act gaa gct aga agc tgc cat ctt	1776
Leu Asp Gly Lys Arg Lys Pro Val Thr Glu Ala Arg Ser Cys His Leu	
580 585 590	
gcc atg gcc ccg aat cat gct gtg gtg tct cgt atg gat aag gtg gaa	1824
Ala Met Ala Pro Asn His Ala Val Val Ser Arg Met Asp Lys Val Glu	
595 600 605	
cgc ttg aaa cag gtg ttg ctc cac caa cag gct aaa ttt ggt aga aat	1872
Arg Leu Lys Gln Val Leu Leu His Gln Gln Ala Lys Phe Gly Arg Asn	
610 615 620	
gga tct gac tgc ccg gac aag ttt tgc tta ttc cag tct gaa acc aaa	1920
Gly Ser Asp Cys Pro Asp Lys Phe Cys Leu Phe Gln Ser Glu Thr Lys	
625 630 635 640	
aac ctt ttg ttc aat gac aac act gag tgt ctt gcc aga ctc cat ggc	1968
Asn Leu Leu Phe Asn Asp Asn Thr Glu Cys Leu Ala Arg Leu His Gly	
645 650 655	
aaa aca aca tat gaa aaa tat ttg gga cca cag tat gtc gca ggc att	2016
Lys Thr Thr Tyr Glu Lys Tyr Leu Gly Pro Gln Tyr Val Ala Gly Ile	
660 665 670	
act aat ctg aaa aag tgc tca acc tcc cca ctc cta gaa gcc tgt gaa	2064
Thr Asn Leu Lys Lys Cys Ser Thr Ser Pro Leu Leu Glu Ala Cys Glu	
675 680 685	
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Phe Leu Arg Lys	
690	

<210> 2  
 <211> 30  
 <212> DNA  
 <213> Artificial Sequence

<220>  
 <223> Description of Artificial Sequence: Synthetic DNA

<400> 2	
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<210> 3  
 <211> 32  
 <212> DNA  
 <213> Artificial Sequence

<220>  
 <223> Description of Artificial Sequence: Synthetic DNA  
  
 <400> 3  
 gagctccttc ggttttactt cctgaggaat tc 32  
  
 <210> 4  
 <211> 42  
 <212> DNA  
 <213> Artificial Sequence  
  
 <220>  
 <223> Description of Artificial Sequence: Synthetic DNA  
  
 <400> 4  
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 <210> 5  
 <211> 36  
 <212> DNA  
 <213> Artificial Sequence  
  
 <220>  
 <223> Description of Artificial Sequence: Synthetic DNA  
  
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 <210> 6  
 <211> 36  
 <212> DNA  
 <213> Artificial Sequence  
  
 <220>  
 <223> Description of Artificial Sequence: Synthetic DNA  
  
 <400> 6  
 tctagagttt tcaaatttga attttaatgt gtgttg 36  
  
 <210> 7  
 <211> 36  
 <212> DNA  
 <213> Artificial Sequence  
  
 <220>  
 <223> Description of Artificial Sequence: Synthetic DNA  
  
 <400> 7  
 ggatcccacc ttaaggaggt tgcaacgagc gtggca 36  
  
 <210> 8

<211> 250  
<212> DNA  
<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthetic DNA

<400> 8

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gattcaccca tccagtgtat ccaggcaatt gcggaaaaca gagctgatgc tgtgactctt 180
gatggtgggt tcatatacga ggcaggactt gcccataca aactgcgacc tgtagcggcg 240
gaagtctacg                                     250
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<210> 9

<211> 250

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthetic DNA

<400> 9

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ctgcgaagtc ctgtgtggca tgacttcaga ctttgaagtt cgttcagctg aaaagatccg 180
cccttcttca caacagccac agcataatag tgagttcgtg gttgtctttc ggtcccgtag 240
acttcgcgcg                                     250
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<210> 10

<211> 250

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthetic DNA

<400> 10

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tgaaagatcc tcaaacactg tgctctctct aataaaagca acatctccag caccgtctct 120
aagacactta aaggcaccag agtagctgaa gtacggttcc tgggatgaga atgcacattt 180
gttttccctt gtccccgcac acaggcgaca aaggttgggg aattgtcctt tatctgcacc 240
tggaacacaa                                     250
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<210> 11

<211> 255

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthetic DNA

<400> 11

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gtacaacca gaatctatcc taggtggcac tctcgaaaac ccaatggcag agtccttgaa 60
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cagaagatct ttctgcccac taggggaacc aaagagctgg aatttcggtg acttgtcctt 120  
tccaaacttt tctgtgctt ggcggagaag attccagatg gcatcctcct ttccattaac 180  
acttcgtgcc acaacggcat gagaaggac ccgtgcaaga tggcaatctt tgaacttgtc 240  
aactggctta cgagt 255

<210> 12  
<211> 251  
<212> DNA  
<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthetic DNA

<400> 12  
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tctgtagtgg aggccgatga gcaggtcaca gatccttcgc tcaaaccact ccactgggta 120  
cacttgcgca actcttgctc tcccaccgca caccaaaca cccgcgcacg ccgggcagca 180  
acttctcct cacttttctt caagttctga attgcagtaa agtatccgga gccaaagtac 240  
aaccagaat c 251

<210> 13  
<211> 75  
<212> DNA  
<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthetic DNA

<400> 13  
atggcttcta tctccacta ctttttagcc ctctctcttt cttgctcttt tcttttcttc 60  
ttatccgact cagtc 75

<210> 14  
<211> 189  
<212> DNA  
<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthetic DNA

<400> 14  
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gtctcatttg gcattgcgta ttgggaaaag cagaaccca gtcacaaca gtgctccga 120  
agttgaata gcgagaaaga ctctacagg aaccaagcat gccacgctcg ttgcaacctc 180  
cttaagtg 189

<210> 15  
<211> 250  
<212> DNA  
<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthetic DNA

<400> 15  
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aagatatcct tccacaggtc tatccacaca gttaggatca gggtcactgc tttgttgtga 180  
tttgtagtgc tctgcaagac aggcaccaa ccacatttac ctgcagtgtgta aacatacctt 240  
ccatccaaac 250

<210> 16  
<211> 254  
<212> DNA  
<213> Artificial Sequence

<220>  
<223> Description of Artificial Sequence: Synthetic DNA

<400> 16  
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ttattctcac cttgctcatc tccaatacac aaagcacaga gattagatct tgggtcagaa 180  
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agcaagccca tggg 254

<210> 17  
<211> 229  
<212> DNA  
<213> Artificial Sequence

<220>  
<223> Description of Artificial Sequence: Synthetic DNA

<400> 17  
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tctagcttca gtcacaggct tacgtttgcc atcgaggcac agcaacgcaa agtctgcaag 180  
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<210> 18  
<211> 210  
<212> DNA  
<213> Artificial Sequence

<220>  
<223> Description of Artificial Sequence: Synthetic DNA

<400> 18  
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tctggcaaga cactcagtgt tgtcattgaa caaaagggtt ttggtttcag actggaataa 180  
gcaaaacttg tccgggcagt cagatccatt 210

<210> 19  
<211> 30

<212> DNA  
<213> Artificial Sequence

<220>  
<223> Description of Artificial Sequence: Synthetic DNA

<400> 19  
ggatccatgg gccgtaggag aaggagtgtt 30

<210> 20  
<211> 28  
<212> DNA  
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<220>  
<223> Description of Artificial Sequence: Synthetic DNA

<400> 20  
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<210> 21  
<211> 1367  
<212> DNA  
<213> Artificial Sequence

<220>  
<223> Description of Artificial Sequence: Synthetic DNA

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ttttaaggca attaagcatg tttgataaaa tatatatatt gttataaata cttttcaaaa 180  
gtataaagtt gatgatggcg tgggtggtaga ttatttttagt tctagggttcg aatgcaagtt 240  
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taggaaaaaaa aagaaatcaa aattgaaaac atcatccggt ggagtcgaga agcccacacc 360  
cacgtgaccc aacaatatta aaataagagt ttgctctaca gtaaatgcga tactttttta 420  
ttcaatactt tttccacttc taaaatcttg gagatttgca ccgttaacta attaagtgtt 480  
atatccaacg gtcctaaaaa aacttggtga ccgtgcctca catttcaact ttgcgcaccc 540  
tgaaagccgt tatgttttagg ttagtggttg caacagttga agcgcatcac tcaggaggct 600  
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cgtacttgaa acttattata aattacataa ttttataagt ttcacttctt atataatact 720  
catataatat ataggggtta gaatgccaat ttttaaaaaa agaataaaaa aataaataga 780  
ataaaatcga aaaaatgaaa tgtaaaaaat ttgaggggga caaataaaat atgaaagtct 840  
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gagatacacg aaaatgtcat gaaacagttg catgtaggga aattaatgta gtagagggat 960  
agcaagacaa aaatccaagc caagctagct gctcacgcga actcgatcca cacgtccttt 1020  
acagagtctt aaacggatga aatctgcatg gcatgcaact aaagcattgt tctcagctgc 1080  
caagtacccc tcacactcac caaccctttg tttttctccc cattgcatgt taactcaagt 1140  
ttatcctttc tttgcttctg gaaatttcac aagcctcaaa cacgtcgacg tccaatcttg 1200  
tgaccaacac ggccaaaaga aaagagaatc tcatcccgtt cacacttagc cacttaaagc 1260  
tagccaaacg gtgatctttc tctatatatt gtagctctct aacacaacca acactaccat 1320  
tattcaatat tcaaaccctg ctctatacta cacacactag aagaata 1367

<210> 22

<211> 962  
<212> DNA  
<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthetic DNA

<400> 22

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ataatatatt tatattttta tatctattct tatgtatttt ttaaaaatct attatatatt 180
gatcaactaa aatattttta tatctacact tattttgcat ttttatcaat tttcttgctg 240
tttttgcat atttaataat gactattctt taataatcaa tcattattct tacatggtag 300
atattgttgg aaccatatga agtggttcatt gcatttgact atgtggatag tgttttgatc 360
catgcccttc atttgccgct attaattaat ttggtaacag attcgttcta atcagttact 420
taatccttcc tcatcataat taatctggta gttcgaatgc cataatattg attagttttt 480
tggaaccataa gaaaaagcca aggaacaaaa gaagacaaaa cacaatgaga gtatcctttg 540
catagcaatg tctaagttca taaaattcaa acaaaaacgc aatcacacac agtggacatc 600
acttatccac tagctgatca ggatcgccgc gtcaagaaaa aaaaactgga ccccaaaagc 660
catgcacaac aacacgtact cacaaaggcg tcaatcgagc agcccaaac attcaccaac 720
tcaacccatc atgagccac acatttggtg tttctaacc aacctcaaac tcgtattctc 780
ttccgccacc tcatttttgt ttatttcaac acccgtaaaa ctgcatccca ccccgtaggc 840
aaatgttcat gcatgttaac aagacctatg actataaata tctgcaatct cggcccaagt 900
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ct
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<210> 23  
<211> 692  
<212> PRT  
<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthetic human lactoferrin

<400> 23

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Gly Arg Arg Arg Arg Ser Val Gln Trp Cys Ala Val Ser Gln Pro Glu
  1             5             10             15

Ala Thr Lys Cys Phe Gln Trp Gln Arg Asn Met Arg Lys Val Arg Gly
  20             25             30

Pro Pro Val Ser Cys Ile Lys Arg Asp Ser Pro Ile Gln Cys Ile Gln
  35             40             45

Ala Ile Ala Glu Asn Arg Ala Asp Ala Val Thr Leu Asp Gly Gly Phe
  50             55             60

Ile Tyr Glu Ala Gly Leu Ala Pro Tyr Lys Leu Arg Pro Val Ala Ala
  65             70             75             80

Glu Val Tyr Gly Thr Glu Arg Gln Pro Arg Thr His Tyr Tyr Ala Val
  85             90             95

Ala Val Val Lys Lys Gly Gly Ser Phe Gln Leu Asn Glu Leu Gln Gly
 100             105             110
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Leu Lys Ser Cys His Thr Gly Leu Arg Arg Thr Ala Gly Trp Asn Val  
 115 120 125  
 Pro Ile Gly Thr Leu Arg Pro Phe Leu Asn Trp Thr Gly Pro Pro Glu  
 130 135 140  
 Pro Ile Glu Ala Ala Val Ala Arg Phe Phe Ser Ala Ser Cys Val Pro  
 145 150 155 160  
 Gly Ala Asp Lys Gly Gln Phe Pro Asn Leu Cys Arg Leu Cys Ala Gly  
 165 170 175  
 Thr Gly Glu Asn Lys Cys Ala Phe Ser Ser Gln Glu Pro Tyr Phe Ser  
 180 185 190  
 Tyr Ser Gly Ala Phe Lys Cys Leu Arg Asp Gly Ala Gly Asp Val Ala  
 195 200 205  
 Phe Ile Arg Glu Ser Thr Val Phe Glu Asp Leu Ser Asp Glu Ala Glu  
 210 215 220  
 Arg Asp Glu Tyr Glu Leu Leu Cys Pro Asp Asn Thr Arg Lys Pro Val  
 225 230 235 240  
 Asp Lys Phe Lys Asp Cys His Leu Ala Arg Val Pro Ser His Ala Val  
 245 250 255  
 Val Ala Arg Ser Val Asn Gly Lys Glu Asp Ala Ile Trp Asn Leu Leu  
 260 265 270  
 Arg Gln Ala Gln Glu Lys Phe Gly Lys Asp Lys Ser Pro Lys Phe Gln  
 275 280 285  
 Leu Phe Gly Ser Pro Ser Gly Gln Lys Asp Leu Leu Phe Lys Asp Ser  
 290 295 300  
 Ala Ile Gly Phe Ser Arg Val Pro Pro Arg Ile Asp Ser Gly Leu Tyr  
 305 310 315 320  
 Leu Gly Ser Gly Tyr Phe Thr Ala Ile Gln Asn Leu Arg Lys Ser Glu  
 325 330 335  
 Glu Glu Val Ala Ala Arg Arg Ala Arg Val Val Trp Cys Ala Val Gly  
 340 345 350  
 Glu Gln Glu Leu Arg Lys Cys Asn Gln Trp Ser Gly Leu Ser Glu Gly  
 355 360 365  
 Ser Val Thr Cys Ser Ser Ala Ser Thr Thr Glu Asp Cys Ile Ala Leu  
 370 375 380  
 Val Leu Lys Gly Glu Ala Asp Ala Met Ser Leu Asp Gly Gly Tyr Val  
 385 390 395 400  
 Tyr Thr Ala Gly Lys Cys Gly Leu Val Pro Val Leu Ala Glu Asn Tyr  
 405 410 415

Lys Ser Gln Gln Ser Ser Asp Pro Asp Pro Asn Cys Val Asp Arg Pro  
 420 425 430  
 Val Glu Gly Tyr Leu Ala Val Ala Val Val Arg Arg Ser Asp Thr Ser  
 435 440 445  
 Leu Thr Trp Asn Ser Val Lys Gly Lys Lys Ser Cys His Thr Ala Val  
 450 455 460  
 Asp Arg Thr Ala Gly Trp Asn Ile Pro Met Gly Leu Leu Phe Asn Gln  
 465 470 475 480  
 Thr Gly Ser Cys Lys Phe Asp Glu Tyr Phe Ser Gln Ser Cys Ala Pro  
 485 490 495  
 Gly Ser Asp Pro Arg Ser Asn Leu Cys Ala Leu Cys Ile Gly Asp Glu  
 500 505 510  
 Gln Gly Glu Asn Lys Cys Val Pro Asn Ser Asn Glu Arg Tyr Tyr Gly  
 515 520 525  
 Tyr Thr Gly Ala Phe Arg Cys Leu Ala Glu Asn Ala Gly Asp Val Ala  
 530 535 540  
 Phe Val Lys Asp Val Thr Val Leu Gln Asn Thr Asp Gly Asn Asn Asn  
 545 550 555 560  
 Glu Ala Trp Ala Lys Asp Leu Lys Leu Ala Asp Phe Ala Leu Leu Cys  
 565 570 575  
 Leu Asp Gly Lys Arg Lys Pro Val Thr Glu Ala Arg Ser Cys His Leu  
 580 585 590  
 Ala Met Ala Pro Asn His Ala Val Val Ser Arg Met Asp Lys Val Glu  
 595 600 605  
 Arg Leu Lys Gln Val Leu Leu His Gln Gln Ala Lys Phe Gly Arg Asn  
 610 615 620  
 Gly Ser Asp Cys Pro Asp Lys Phe Cys Leu Phe Gln Ser Glu Thr Lys  
 625 630 635 640  
 Asn Leu Leu Phe Asn Asp Asn Thr Glu Cys Leu Ala Arg Leu His Gly  
 645 650 655  
 Lys Thr Thr Tyr Glu Lys Tyr Leu Gly Pro Gln Tyr Val Ala Gly Ile  
 660 665 670  
 Thr Asn Leu Lys Lys Cys Ser Thr Ser Pro Leu Leu Glu Ala Cys Glu  
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<212> DNA  
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<220>

<223> Description of Artificial Sequence: Synthetic DNA gmbpsp

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atgtaataat atatttatat tttaatatct attcctatgt atttttttaa aatctattat 180
atattgatca actaaaatat ttttatatct acacttattt tgcattttta tcaattttct 240
tgcgtttttt ggcatattta atatgactat tctttaataa tcaatcatta ttcttacatg 300
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gtcccatgcc cttcatttgc cgctattaat taatttggtg acagattcgt tctaatacgt 420
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tttttgacc ataagaaaaa gccaaggaac aaaagaagac aaaacacatg agagtatcct 540
ttgcatagca atgtctaagt tcataaaatt caaacaaaaa cgcaatcaca cacagtggac 600
atcacttatc cactagctga tcaggatcgc cgcgtcaaga aaaaaaaact ggaccccaaa 660
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actcaacca tcatgagccc acacatttgt tgtttctaac ccaacctcaa actcgtattc 780
tcttcgcca ctcattttgc tttatttcaa caccgctcaa actgcatccc acccgtggc 840
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ttttcatcat caagaaccag ttcaatatcc tagtacgccg tattaagaa tttaagatat 960
actatgatga gagcgcggtt cccattactg ttgctgggag ttgttttcct agcatcagtt 1020
tctgtctcat ttggcattgc gtattgggaa aagcaaacc cagtcacaac aagtgcctcc 1080
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tccttaaggt gggatcc 1157
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<211> 1164

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthetic DNA PCONGT7Sp6

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<223> a, t, c, g, other or unknown

<220>

<221> modified\_base

<222> (763)

<223> a, t, c, g, other or unknown

<220>

<221> modified\_base

<222> (787)

<223> a, t, c, g, other or unknown

<220>

<221> modified\_base

<222> (789)

<223> a, t, c, g, other or unknown

<220>  
 <221> modified\_base  
 <222> (878)  
 <223> a, t, c, g, other or unknown

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 tatgtaataa tatatttata ttttaatatc tattcttatg tattttttta aaatctatta 180  
 tatattgatc aactaaaata tttttatatc tacacttatt ttgcattttt atcaattttc 240  
 ttgcgttttt tggcataatt aataatgact attctttaat aattaatcat tattcttaca 300  
 tcgtacatat tgttggaacc atatgaagtg tccattgcat tcgactatgt ggatagtgtt 360  
 ttgatccagg cctccatttg ccgcttatta attaatttgg taacagtccg tactaatcag 420  
 ttacttatcc ttcctccatc ataattaatc ttggtagtct cgaatgccac aacactgact 480  
 agtctcttgg atcataagaa aaagccaaga acaaaaggag acaaaacaca atgnagagta 540  
 tcctttgcat agcaatgtct aagttcataa aattcaaaca aaaacgcaat cacacacagt 600  
 gggacatcac ttatccacta gctgatcagg atcgccgcgt caagaaaaaa aaaactggga 660  
 cccaaaagcc atgcacaaca acacgtactc acaaagggtg caatcgagca gcccaaaaaca 720  
 ttcaccaact caacccatca tgagcccaca catttggtgt ttntaaccga acctcaaact 780  
 cgtattntnt tccgccacct catttttgtt tattccaaca cccgtcaaac tgcattgccac 840  
 cccgtggcca aatgtccatg catgttaaca agacctanga ctataaatat ctgcaatctc 900  
 ggcccagggt ttcatcatca agaaccagtt caatatccta gtacaccgta ttaaagaatt 960  
 taagatatac tatgatgaga ggcgggttcc cattactggt gctggagttg ttttcttggc 1020  
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 tgcaacctcc ttaagggtgg atcc 1164

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 <211> 25  
 <212> PRT  
 <213> Artificial Sequence

<220>  
 <223> Description of Artificial Sequence: Synthetic signal peptide

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 Phe Leu Phe Phe Leu Ser Asp Ser Val  
 20 25